Non-destructive Examination of Tree Trunks with the Help of National Instruments Devices

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The parameters of vibration signals spreading in a special type of tree trunk change depending on the damaged or dead portions inside it, because the vibrations will only spread in the higher density regions. So the time of the signal flight, the amplitude and other parameters of the signals will change too depending on the inner structure of the tree trunk. I'm measuring these parameters, primarily the time of flight and the amplitude with piezolelctrical accelerometers and a prototype measurement system based on National Instruments devices. The software controlling the measurement system and preprocessing the data is based on LabVIEW. I'm trying to build up a picture of the inner structure of the tree trunk from multiply generation and measurement cycles on a PC. This first approach is required to determine the parameters that should be measured and algorithms that should be used in the future. The final goal is to build a portable device capable of examining the inner structure of a tree trunk on the field without the need for using a computer.

The purpose of this paper is to show the different type of National Instruments devices, that I used, and the results, that I achieved in my work so far.

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